

A CHECKLIST OF THE STONEFLIES (PLECOPTERA) OF THE DANIEL BOONE NATIONAL FOREST IN KENTUCKY, U.S.A.¹

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ABSTRACT: A total of 69 species representing nine families and 30 genera of stoneflies are found in the Daniel Boone National Forest in eastern Kentucky. Two hundred and fifty-five new county records were identified from 163 streams in 21 counties. Three new state records, including *Pteronarcys biloba* Newman, *Paracapnia angulata* Hanson, and *Perlesta decipiens* (Walsh), and *Isoperla orata* Frison, were identified from the study area.

KEY WORDS: Plecoptera, stoneflies, Daniel Boone National Forest, Kentucky, U.S.A.

The Daniel Boone National Forest was established as the Cumberland National Forest on February 23, 1937. The name was officially changed on April 11, 1966, to honor the great Kentucky Pioneer, Daniel Boone (Collins, 1975). Previously, aspects of the stonefly fauna of the Daniel Boone National Forest in eastern Kentucky have been recorded by Picazo and DeMoss (1980), Tarter et al. (1982, 1984), Allen and Tarter (1985), Surdick (1985), Kondratieff and Kirchner (1988, 1996), and Pond (1999). The checklist presented herein represents the first attempt to list the stoneflies (nymphs and adults) found in the streams located in 21 counties within the Daniel Boone National Forest. The list indicates nine families, 30 genera, and 69 species. Additionally, 255 new county records were added to the study area. Of the known stonefly species in Kentucky (91), 76 percent were found in the Daniel Boone National Forest.

The Daniel Boone National Forest is located in the Cumberland Plateau and Cumberland Mountain region of eastern Kentucky and encompasses approximately 849,870 hectares within its proclamation boundary (Fig. 1). The land is rugged and characterized by steep forested ridges, narrow valleys, and contains approximately 11,900 km of perennial streams and rivers. Collections for this investigation were made from 163 streams. They were taken mostly from stream orders 1-3, and many collections were taken from very small unnamed branches and tributaries. Stoneflies and detailed data (streams, collection dates, collector) were deposited in the West Virginia Benthological Survey at Marshall University. The following counties (21) have land areas that are contained within the proclamation boundary of the Daniel Boone National Forest: Bath, Clay, Estill, Harlan, Jackson, Knox, Laurel, Lee, Leslie, McCreary, Menifee, Morgan, Owsley, Perry, Powell, Pulaski, Rockcastle, Rowan, Wayne, Whitley, and Wolfe.

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Figure 1. Map of Kentucky (U.S.A.) highlighting the Daniel Boone National Forest in the eastern portion of the state.

Stoneflies were collected from the following streams and rivers within three drainage basins (Cumberland, Kentucky, and Licking rivers): Bath Co.: Big Cave Run, Caney Creek, Clear Creek, Joes Branch, Licking River, Salt Lick Creek. Clay Co.: Buzzard Creek, Red Bird River, Spring Creek. Estill Co.: Oak Creek, Station Camp Creek, Sudders Fork. Harlan Co.: Abner Branch, Bills Branch, Big Laurel Creek, Little Laurel Creek, Laurel Fork. Jackson Co.: Brashears Creek, Cavenaugh Creek, Horselick Creek, Owsley Fork, Panther Creek, Peter Branch, Raccoon Creek, Rockcastle River, South Fork, War Fork. Knox Co.: Disappointment Creek. Laurel Co.: Cane Creek, Hawk Creek, Pine Creek, Rockcastle River, Wood Creek. Lee Co.: Little Sinking Creek, Ross Creek, Smith Branch, Stillwater Creek, Sturgeon Creek. Leslie Co.: Cutshin Creek, Elkorn Creek, Middle Fork (Kentucky River), Sugar Creek. McCreary Co.: Beaver Creek, Cogur Creek, Cumberland River, Eagle Creek, Indian Creek, Marsh Creek, Rock Creek, Yahoo Creek. Menifee Co.: Beaver Creek, Clifty Creek, Copperas Creek, Duncan Branch, Edwards Branch, Gladie Creek, Indian Creek, Klaber Branch, Sal Branch, Sargent Branch, Wolfpen Creek. Morgan Co.: Buckhorn Creek, Licking River, Open Fork, Yocum Creek. Owsley Co.: Buck Creek, Cow Creek, Crane Fork, Wild Dog Creek. Perry Co.: Pig Pen Branch, Squabble Creek, Stable Fork. Powell Co.: Amburgy Hollow Branch, Auxier Branch, Fish Trap Branch, Grays Branch, King Branch, Mill Creek, Nation Camp Creek, Red River (Middle and South Forks), Rush Branch, Upper Hood Branch, Whittleton Branch. Pulaski Co.: Big Lick Branch, Bear Creek, Buck Creek. Rockcastle Co.: Brush Creek, Crooked Creek, Renfro Creek, Rockcastle River, Roundstone Creek, White Oak Creek. Rowan Co.: Abner Tackett Branch, Claylick Branch, Dry Creek, Elk Lick Fork, Hays Branch, Kiser Branch, Licking River, Logan Hollow, Mills Branch, Ramey Creek, Scott Creek, Slabcamp Creek, Sugar Camp Creek, Triplett Creek, White Pine Branch. Wayne Co.: Burnett Creek, Little South Fork, Lonesome Creek.

Whitley Co.: Bark Camp Creek, Brier Creek, Cumberland River, Dog Slaughter Creek, Little Dog Slaughter Creek, Poplar Creek, Little South Fork. Wolfe Co.: Chestnut Log Branch, Chimney Top Creek, Laurel Branch, Parched Corn Creek, Red River (Middle and North Forks), Rockbridge Fork, Swift Camp Creek.

The Red River Gorge Geological Area, which is confined to Menifee, Powell, and Wolfe counties, is a unique and scenic area in the Daniel Boone National Forest. Within the Red River Gorge is an area classified as the Clifty Wilderness Area. These two areas together form a rugged and picturesque forest area of more than 10,117 ha. This gorge area features numerous stone arches, precipitous cliffs, craggy pinnacles, cascading waterfalls, and many other natural features (McGrain, 1983). Nine families, 2 genera, and 36 species of stoneflies were found in this area, including three new state records. The 36 species comprised 52 percent of the stoneflies in the Daniel Boone National Forest and also 40 percent of the known species in Kentucky.

The following new state records were identified from the Daniel Boone National Forest (M represents male and F represents female): 1) *Pteronarcys biloba* Newman (nymphs) (Menifee County/Wolfpen Creek, May 23, 2002; Wolfe County/Parched Corn Creek, June 3, 2000, and Chimney Top Creek, June 1, 2000, and Rowan County/Licking River, July 3, 2001). 2) *Paracapnia angulata* Hanson (adult/M) (Powell County/Amburgy Hollow Branch, March 2, 1974), 3) *Perlesta decipiens* (Walsh) (adults/M, F) (Wolfe County/Red River Gorge, June 23, 1992).

Acroneuria abnormis was identified from all 21 counties in the study area, while *A. carolinensis* was found in 18 counties (86 percent). Two perlids have their type-locality in the Daniel Boone National Forest: *Acroneuria hitchcocki* Kondratieff and Kirchner (Rowan County/Ramey Creek, April 30, 1987) and *Hansonoperla hokolesqua* Kondratieff and Kirchner (Rowan County/Abner Tackett Branch/May 16, 1990). The following sentential (threatened) taxa were found in the study area: *A. hitchcocki*, *Alloperla hamata* Surdick and *H. hokolesqua*.

Checklist of the Daniel Boone National Forest in Kentucky

Below is a checklist of 69 stonefly species identified from the Daniel Boone National Forest. Counties of collection are enclosed in parenthesis. New county species records are indicated with an asterisk, while new state species records are denoted by a double asterisk.

Euholognatha

Capniidae

- Allocapnia curiosa* (*Clay, *Jackson, *Menifee)
- A. forbesi* Frison (Lee, *Rowan)
- A. frisoni* Ross and Ricker (*Rowan)
- A. granulata* Claassen (*Laurel, *Rockcastle)
- A. indianae* Ricker (Rowan)
- A. mystica* Frison (*McCreary, *Morgan)

- A. navicola* (Fitch) (*Clay, *Estill, *Jackson, *Rockcastle)
A. ohioensis Ross and Ricker (Rowan)
A. pygamaea (Burmeister) (*Clay, *Estill, *Leslie, *Menifee, *Morgan, *Powell, *Rowan, *Wolfe)
A. recta (Claassen) (*Estill, *Jackson, *Laurel, *Menifee, *Morgan, *McCreary, Powell, *Rockcastle, *Rowan, *Wolfe)
A. rickeri Frison (Bath, *Estill, *Laurel, *Lee, *Menifee, *Morgan, *Powell, *Rockcastle, Rowan, *Wolfe)
A. vivipara (Claassen) (Rowan)
A. zola Ricker (*Morgan)
 ***Paracampia angulata* Hanson (*Jackson, *Powell)

Leuctridae

- Leuctra ferruginea* (Walker) (*Knox, McCreary, *Powell, Wolfe)
L. rickeri James (Menifee, Rowan)
L. sibleyi Claassen (Rowan)
L. tenuis (Pictet) (Jackson)
Paraleuctra sara (Claassen) (*Menifee)
Zealeuctra claasseni (Frison) (*Morgan)

Nemouridae

- Amphinemura delosa* (Ricker) (*Clay, *Harlan, *Knox, *Lee, *Leslie, McCreary, Menifee, *Morgan, *Owsley, *Perry, *Powell, *Pulaski, *Rowan, *Whitley, *Wolfe)
A. nigrifera (Provancher) (McCreary, *Morgan, Rowan)
A. wui (Claassen) (McCreary)
Prostoia completa (Walker) (*Menifee, Pulaski)
P. similis (Hagen) (*Clay, *Jackson, *Menifee, Morgan, *Powell, *Rowan)
Soyedina vallicularia (Wu) (*Powell)

Taeniopterygidae

- Oemopteryx contoria* Needham and Classen (*Bell, *Harlan, Rowan)
Strophopteryx fasciata (Burmeister) (*Clay, Estill, Jackson, *Leslie, *Menifee, *Morgan, *Perry, *Powell, *Rowan, *Wolfe)
Taeniopteryx burksi Ricker and Ross (*Clay, *Estill, Jackson, *Laurel, *Perry, Rockcastle, *Rowan)
T. maura (Pictet) (*Clay, *Estill, Jackson, *Leslie, *Menifee, *Morgan, *Owsley, *Powell, *Pulaski, *Rockcastle, *Rowan, Wayne, *Whitley, *Wolfe)
T. metequi Ricker and Ross (Jackson, *Morgan, *Powell, Pulaski, Rockcastle, *Rowan, Whitley, *Wolfe)

Systelognatha

Chloroperlidae

- Alloperla chloris* Frison (Jackson, Menifee)
A. hamata Surkick (Rowan)
A. ideii (Ricker) (Morgan)
A. imbecilla (Say) (Jackson)
Haploperla brevis (Banks) (Bath, *Harlan, *Knox, *Leslie, McCreary, *Menifee, Morgan, *Owsley, *Powell, *Pulaski, *Rowan, Whitley, Wolfe)
Sweltsa onkos (Ricker) (*Lee, *Menifee, *Powell, Rowan)

Peltoperlidae

- Peltoperla arcuata* Needham (*Clay, *Harlan, *Jackson, *Laurel, *Leslie, McCreary, Menifee, *Morgan, *Owsley, *Powell, *Rowan, Wolfe)

Perlidae

- Acronemura abnormis* (Newman) (Bath, *Clay, *Estill, *Harlan, *Jackson, *Knox, *Laurel, *Lee, *Leslie, McCreary, Menifee, *Morgan, *Owsley, *Perry, Powell, *Pulaski, *Rockcastle, *Rowan, *Wayne, *Whitley, *Wolfe)

- A. carolinensis* (Banks) (*Clay, *Estill, *Harlan, Jackson, *Knox, *Laurel, *Lee, *Leslie, *Menifee, *Morgan, *Owsley, *Perry, *Powell, *Pulaski, *Rockcastle, *Rowan, *Whitley, *Wolfe)
- A. filicis* Frison (Whitley)
- A. frisoni* Stark and Brown (*Bath, *Jackson, *Laurel, *McCreary, *Owsley, *Powell, *Rockcastle, *Rowan, *Whitley)
- A. hitchcocki* Kondratieff and Kirchner (Rowan)
- A. internata* (Walker) (*Wayne)
- A. lycorias* (Newman) (McCreary, *Rockcastle, *Rowan, *Whitley)
- A. perplexa* Frison (*Jackson)
- Eccoptura xanthenes* (Newman) (*Clay, *Knox, Laurel, *Lee, *Leslie, *McCreary, *Menifee, *Owsley, *Powell, *Pulaski, *Rockcastle, *Rowan, Whitley, Wolfe)
- Hansonoperla hokolesqua* Kondratieff and Kirchner (Rowan)
- ***Perlesta decipiens* (Walsh) (*Wolfe)
- Perlinella drymo* (Newman) (Rowan)
- Neoperla gaufini* Stark and Baumann (*Morgan)
- Agnetina capitata* (Pictet) (*Jackson, *Lee, *Pulaski, *Wayne, *Whitley)
- A. flavescens* (Walsh) (*Harlan, *Jackson, *Rockcastle)
- Paragnetina immarginata* (Say) (Harlan)

Perlodidae

- Chioptera clio* (Newman) (*Bath, *Clay, *Estill, *Harlan, *Laurel, *Lee, *Leslie, *Menifee, *Morgan, *Powell, *Rockcastle, *Rowan, *Wayne, *Wolfe)
- Diploperla robusta* Stark and Gaufin (*Bath, *Knox, *McCreary, *Morgan, *Powell, Rowan)
- Isoptera burksi* Frison (Menifee, *Rowan)
- I. holochlora* (Klapalek) (*Bath, *Harlan, *Knox, *Morgan, *Owsley, *Perry, *Powell, *Rowan, *Wolfe)
- I. namata* Frison (*Clay, *Menifee, *Powell, Wolfe)
- I. richardsoni* Frison (Jackson, *Menifee)
- I. similis* (Hagen) (*Harlan, *Jackson, *Knox, *Laurel, McCreary, *Powell, Wolfe)
- I. transmarina* (Newman) (*Bath, *Jackson, Menifee, *Perry, *Powell, Rowan, *Wolfe)
- Malirekus hastatus* (Banks) (*Harlan, *Knox, *Leslie, McCreary, *Menifee, *Perry, *Powell, *Rowan)
- Remenus bilobatus* (Needham and Claassen) (*Bath, *Harlan, McCreary, *Menifee, *Morgan, *Powell, *Rowan, *Wolfe)
- Yugus kirchneri* Nelson (*Harlan, *Knox, *Morgan, *Perry)

Pteronarcyidae

- ***Pteronarcys biloba* Newman (*Menifee, *Rowan, *Wolfe)
- P. comstocki* Smith (Jackson)
- P. dorsata* (Say) (Rowan)
- P. proteus* Newman (*Harlan, *Knox, *McCreary, *Menifee, *Perry, *Powell, *Rowan, Wolfe)

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